

**Review**

## The Practice of Korean Medicine: An Overview of Clinical Trials in Acupuncture

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Acupuncture, one of the Oriental medical therapeutic techniques that can be traced back at least 2500 years, is growing in popularity all over the world. Korea has continued to develop its own unique tradition of medicine throughout its long history, and has formed different types of acupuncture methods. The purpose of this review is to summarize clinical case studies in acupuncture and related therapies, such as acupressure, electric acupuncture, auricular acupuncture and moxibustion in Korea. A survey of Korean journals revealed that a total of 124 studies were published from 1983 to 2001. Results obtained from the survey showed that most clinical studies using acupuncture, electric acupuncture, moxibustion and other traditional therapies could alleviate a relatively broad range of medical problems. However, it should be emphasized that almost all clinical case studies published in various local journals did not follow the ‘good clinical practice’ with respect to regulatory aspects. Since they were not conducted using the randomized double-blinded controls with a large sample size, all the results should be considered as therapeutic indications. This review is an attempt to show the scope of acupuncture in our country and the kind of diseases, after many years of clinical experience, that were deemed valid targets for clinical trials.

**Keywords:** acupuncture – clinical study – Korean acupuncture

### Introduction

Acupuncture, one of the Oriental medical therapeutic techniques inherited from ancient East Asia, is gaining popularity in the West as an alternative and complementary therapeutic intervention (1). Acupuncture is now being used in Western medicine to treat postoperative-induced and chemotherapy-induced nausea and vomiting, postoperative dental pain, drug addiction, stroke rehabilitation and asthma (2). Korea has continued to develop its own unique traditional medicine

throughout its long history, and has formed different types of acupuncture methods, apart from those of traditional Chinese medicine. An individualized approach based on constitutional energy traits and practical approaches applying new therapeutic modalities have been developed for treatment of disorders (3).

A large number of clinical studies using acupuncture have been performed to demonstrate its efficacy for many kinds of diseases, such as pain (headache, facial pain, neck pain, shoulder pain, lower back pain and knee pain), stroke, facial palsy and other diseases in Korea. A wide range of control groups were used in these studies. Acupuncture and acupuncture-related therapies have been compared with various forms of control acupuncture, standard care, no treatment, baseline conditions and placebo acupuncture. These inconsistencies

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make the task of designing and performing systematic reviews or meta-analyses more difficult. However, non-controlled clinical trials might also be useful for the overview that they provide of what is known so far, with data that may inform future research. This review is an attempt to show a variety of applications for acupuncture treatments performed by the traditional Korean medical sector.

## Clinical Studies Using Acupuncture Treatment in Korea

### Acupuncture for Pain

#### *Headache*

Lee and Kim (4) analyzed the effect of acupuncture treatment at trigger points in 27 patients with headache. Lee *et al.* (5) compared the effect of acupuncture at trigger points with the effect of acupuncture at remote acupuncture points in patients who were diagnosed as having tension-type headaches. A clinical study of auricular acupuncture was also done in 55 patients with headaches (6). Clinical studies of acupuncture and auricular acupuncture for tension-type headaches were also performed (7,8) (Table 1).

#### *Facial Pain*

Temporomandibular disorder (TMD) is a musculoskeletal problem of the masticatory system and is quite commonly treated by acupuncture in the general population. It was reported that 8 and 10 cases, respectively, of TMD were treated by acupuncture (9,10). Wang *et al.* (11) treated by Dong-Qi acupuncture and subjectively evaluated TMD and facial pain (Table 2).

#### *Neck Pain*

Chun and Lee (12) treated patients with chronic neck pain by using electric acupuncture (0.3 × 40 mm, 3.5–12 Hz, 9 V). Kim and Lee (13) compared the group treated by both acupuncture and manipulation (chuna) treatment with the group only treated by acupuncture. A clinical study investigated the clinical applications of Oriental medical therapies including acupuncture treatment together with herbal therapy and hot pack for patients complaining of cervical pain caused by traffic accidents (14). It was reported that acupuncture treatment was effective in 50 patients with cervical pain (15). Lee and Lee (16) treated 25 patients with neck pain with electric acupuncture together with herbal therapy, cupping therapy and hot pack. It was also reported that acupuncture was effective in treating 50 patients with herniated cervical disc (17) (Table 3).

#### *Shoulder Pain*

Forty-three patients suffering from frozen shoulder during physical exercise were treated by acupuncture, moxibustion and electric acupuncture, and evaluated with Apley scratch

**Table 1.** Acupuncture for headache

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Byun and Ahn (6)	Headache	55	AA	2/1 week various times	None	Classified into five groups (excellent, good, moderate, slight and unchanged) by clinical evaluation	Recovered, 9.1%; good, 36.4%; moderate, 27.3%; slight, 12.7%; unchanged, 4.5%	N/A
Kim and Kim (7)	Strained headache	75	CA (0.25 × 40 mm), AA (1/2–4 days)	15 min	None	Classified into three groups (excellent, fair and unchanged) by clinical evaluation	Excellent, 12%; fair, 62.7%; unchanged, 5.3%	N/A
Lee and Kim (4)	Headache	27	Trigger point Tx	Stimulation by needle or 15 min various times	Infrared	Classified into five groups (good, fair, poor, bad and unknown) by clinical evaluation	Good, 25.93%; fair, 48.15%; poor, 7.41%; bad, 3.70%; unknown, 14.81%	N/A
Kim <i>et al.</i> (8)	Chronic headache	36	CA (0.25 × 30 mm), AA (2/1 week)	20 min 3/1 week for 4 weeks	None	Assessment through questionnaires and self-rating headache score	CA and AA were effective Tx on long-term analgesics-abused headache patients, especially tension-type headache group	P < 0.05
Lee <i>et al.</i> (5)	Tension-type headache	40	20	Trigger point Tx	Stimulation by needle or 10 min for 4 times	Infrared, exercise	VAS	No difference between groups N/S
		20		Remote acupuncture point needling: Dong-si acupuncture	10 min for 4 times			

CA, classical acupuncture; AA, auricular acupuncture; Tx, treatment; VAS, visual analog score; N/A, not applicable; N/S, not significant.

**Table 2.** Acupuncture for facial pain (temporomandibular joint disease)

Author name(s)	Number of points	Type of acupuncture	Length and number of TX	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Kim and Kim (9)	8	CA	Various; 3–4 times	Infrared, self-stretch teaching and Herb-med	Clinical evaluation	Report of each patient (acupuncture treatment was effective)	N/A
Byun <i>et al.</i> (10)	10	CA (0.25 × 30 mm), AA, EA and depletion of blood (some cases)	15 min 1/2 days various times	US, equalizer medium size, etc	Examine changes of symptoms, X-ray and DITI	Report of each patient (acupuncture treatment was effective)	N/A
Wang <i>et al.</i> (11)	40	CA (0.3 × 40 mm)	10 min 1–2/1 week various times	Dong-Qi acupuncture treatment (move mouth during acupuncture stimulation)	Analyze function and clinical improvement (by subjective assessment paper)	Most of them (questionnaires in subjective assessment paper) were significantly improved	$P < 0.05$ , $P < 0.01$

Herb-med, herbal medicine; EA, electrical acupuncture; US, ultrasound; DITI, digital infrared thermographic imaging.

test. A total of 16.3% of them reported that the results of treatment were excellent and 30.2% of them reported that they were good (18). Cho and Lee (19) showed the correlation between digital infrared thermography image (DITI) data and changes in clinical symptoms after acupuncture treatment in patients with frozen shoulder (Table 4) (Fig. 1).

### Low Back Pain

A series of 20 cases with lumbar herniated disc disease were treated by acupuncture (20). It was reported that acupuncture and herbal medicine alleviated the symptoms of the herniation of lumbar intervertebral disc (21–25). It was also reported that bee venom acupuncture (BVA) was beneficial for treating herniated intervertebral disc (HIVD) (26). Park *et al.* (27) performed clinical studies using acupuncture and manipulation treatment on 30 HIVD patients. It was found that microcurrent electrical neuromuscular stimulation was significantly effective in decreasing the visual analog scores of patients with lower back pain (28). Park *et al.* (29) reported a clinical study of the stability of the lumbosacral angle of 69 patients suffering from lower back pain. The morphological changes were demonstrated by computed tomographic scan examination of acute HIVD patients who underwent Oriental medical treatment (30).

A clinical study compared acupuncture with electric acupuncture for patients with HIVD (31). Park and Lee (32) compared the effect of electric acupuncture with the effect of Dong-si acupuncture on patients with HIVD. Lee and Hwang (33) compared electric acupuncture with electric acupuncture and Saam acupuncture in HIVD patients. Yoon *et al.* (34) compared acupuncture at A-shi points with acupuncture on acupuncture points in HIVD patients. Chae *et al.* (35) compared conventional acupuncture with Eight constitution acupuncture and demonstrated that Eight constitutional acupuncture was more beneficial than conventional acupuncture for the treatment of HIVD patients.

Electric acupuncture decreased the frequency of radiating pain in lumbar spondylosis (36). Clinical studies evaluated Oriental medical treatment and manipulation therapy in patients with scoliosis (37,38). Kim (39) reported the results of 96 patients suffering from sciatica with lower back pain treated by acupuncture and herbal medicine. It was reported that acupuncture, moxibustion and herbal medicine were useful for acute back pain (40). Lee and Yin (41) also reported a clinical study of BVA on ankylosing spondylitis. Lee *et al.* (42) performed a clinical study on acupuncture for stable thoracolumbar vertebral fractures. It was reported that acupuncture, electric acupuncture, acupuncture at Hua-Tuo-Jia-Ji-Xue were useful for the treatment of thoracolumbar compression fracture (43–45). Han (46) treated degenerated stenosis patients (37 cases), and Kim *et al.* (47) evaluated the clinical results of the spondylolisthesis patients treated by Oriental medical methods.

Lee *et al.* evaluated acupuncture treatment for HIVD and stable compression fracture patients using DITI (48,49).

**Table 3.** Acupuncture for cervical pain

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Chun and Lee (12)	Cervical pain	34	EA (0.3 × 40 mm low frequent, 3.5–12 Hz, 9 V)	15 min various times	Infrared, chuna and Herb-med (some cases)	Classified into four groups (excellent, good, fair and poor) by change of symptoms, ROM, physical examination	Excellent, 11.8%; good, 52.9%; fair, 20.6%; poor, 14.7%	N/A
Lee and Lee (16)	Neck pain	25	CA, EA (1–2.5 Hz, constant or intermittent)	20–30 min various times	Herb-med, chuna (10 min, 4/1 week) and cupping therapy, EST, TENS, micro wave, hot pack, C-traction, etc.	Classified into four groups (excellent, good, fair and poor) by change of symptoms, ROM, physical examination	Excellent, 16%; good, 44%; fair, 24%; failure, 16%	N/A
Lee <i>et al.</i> (15)	Cervical pain	50	CA	20–30 min various times	Herb-med, negative (1/1 day), chuna (10 person, 2–3/1 week)	Classified into four groups (excellent, good, fair and failure) by changes of symptoms, ROM and physical examination	Excellent, 6%; good, 32%; fair, 56%; failure, 6%	N/A
Choi <i>et al.</i> (14)	Cervical pain (by traffic accident)	52	CA	Not stated	Herb-med, Oriental Phy-Tx (hot pack, TENS, SSP, Negative, US, traction, etc.), chuna, C-H pas (some cases)	Classified into five groups (excellent, improved, mild improved and failure) by changes of symptoms and ROM	Excellent, 17.31%; improved, 40.38%; mild improved, 32.69%; failure, 9.62%	N/A
Lee <i>et al.</i> (17)	HNP of C-spine	50	CA (0.25 × 30 mm), depletion of blood	28 min daily various times	Cervical traction, cervical collar, etc.	Classified into four groups (excellent, good, fair and poor) by criteria of Martin A.N.	Excellent, 70%; good, 20%; fair, 6%; poor, 4%	N/A
Kim and Lee (13)	Neck pain	72	32	CA (0.25 × 40 mm)	15 min 1/2 days 6 times Same	Chuna (various methods, 1/2 days, 6 times) None	Measure VAS, ROM	Group treated by acupuncture with chuna was better than group treated by only acupuncture in the degree of improvement in pain and ROM

ROM, range of motion; Phy-Tx, physical therapy; TENS, transcutaneous electrical nerve stimulation; EST, electrical stimulation therapy; HNP, herniated nucleus pulposus; SSP, silver spike point; LBP, Low back pain; IFC, interferential current; FES, functional electrical stimulation.

*P < 0.001*

**Table 4.** Acupuncture for shoulder pain

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Park and Lee (18)	Frozen shoulder	43	CA (0.35 × 40 mm), EA (2 Hz, continuous), direct moxibustion	20–30 min 3–5/1 week various times	Herb-med	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and Apley scratch test	Excellent, 16.3%; good, 34.8%; fair, 18.6%; failure, 30.2%	N/A
Cho and Lee (19)	Frozen shoulder	23	CA (0.25 × 30 mm), indirect moxibustion, fire needle	20–30 min daily various times	Herb-med, ICT, US, hot pack	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI	DITI was valuable in the evaluation of therapeutic effect of acupuncture Tx	N/A

ICT, interferential current therapy.

Cho and Kim (50) compared the acupuncture with electric acupuncture for HIVD patients using DITI. Hur *et al.* (51) investigated changes in the clinical symptoms of patients with spondylolisthesis after acupuncture treatment and evaluated alterations in DITI. A clinical study also reported a relationship between cigarette smoking and the result of Oriental medical treatment for lower back pain (52). Heo and co-workers studied the treatment of lower back pain and sciatica and found some correlation in the rate of alleviation with alterations in Moire topography (53,54) (Table 5).

### Knee Joint Pain

It was reported that acupuncture was useful for the treatment of degenerative arthritis of knee joints (55–57). Woo *et al.* (58) evaluated the clinical effect of acupuncture on microtraumatic injuries of the knee joint. Kim and Lee compared acupuncture with BVA for osteoarthritis (59,60). Hwang *et al.* (61) measured the change of C-reactive protein (CRP), erythrocyte sedimentation rate (ESR) and rheumatoid arthritis (RA) factor, and the satisfactory assessment after BVA treatment in RA patients. Hwang (62) treated RA patients with herbal acupuncture (HA) and evaluated CRP, ESR, RA factor and immunoglobulin G and M (Table 6).

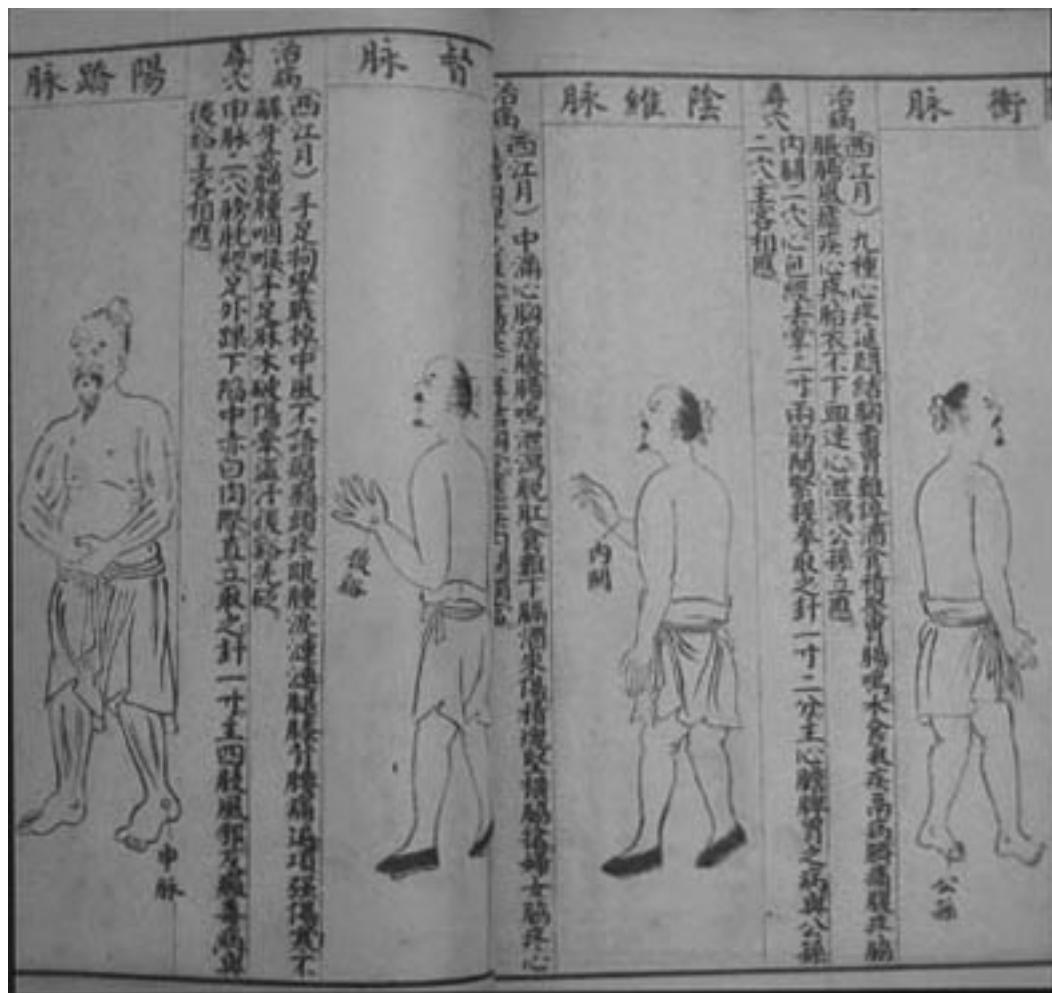
### Other Painful Diseases

Electrical acupuncture stimulation was very useful to relieve pain that had not responded to various conventional medications including nerve blocks, neurosurgical intervention and neuropolitics (63). Cho *et al.* (64) compared acupuncture treatment and analgesics in postthoracotomy pain control. It was reported that venesection, a therapeutic method of sucking out non-physiological blood, alleviated pain induced by blood circulation dysfunction (65). Kim *et al.* (66) compared acupuncture treatment with trigger point treatment in ankle sprain patients. Bang *et al.* (67) carried out a clinical study on patients with humeral lateral epicondylitis or tennis elbow. Seung and Ahn (68) investigated the effect of moxibustion on the immune activity in the treatment of patients. Acupuncture treatment was very beneficial for acute gout (69). It was also demonstrated that acupuncture at acupoints on the non-injured side were as effective as acupuncture at acupoints on the injured side in ankle sprain patients (70) (Table 7) (Fig. 2).

### Acupuncture for Stroke

#### Stroke

Ha *et al.* (71) reported a clinical study of acupuncture and scalp acupuncture on stroke patients (29 cases). Lee *et al.* (72) evaluated the change of blood pressure and body temperature of the stroke patients after venesection at Sybsun points, 10 acupoints located at the tips of all fingers and demonstrated that venesection at Sybsun points could alleviate hypertension in stroke patients. Park *et al.* (73) examined electrical stimulation at GV26 and CV24 on blood pressure, heart rate and cerebral



**Figure 1.** ‘Acu-moxibustion Being Easy to Learn’, published in the Ching dynasty, 18th century. (Courtesy of Dr Kim Nam-II, Department of Medical History, College of Oriental Medicine, Kyung Hee University, Seoul, South Korea.)

blood flow (CBF) in ischemic stroke patients with transcranial doppler sonography. Ahn *et al.* (74) investigated change in 24 h blood pressure after auricular acupuncture treatment in stroke patients using an ambulatory blood pressure monitor. Kang *et al.* (75) compared acupuncture at ST36 and LI11 with stimulation at non-acupoints near these acupoints for the modulation of hypertension of acute stroke patients. Moon *et al.* (76) compared acupuncture at ipsilateral points with that at contralateral points on the cerebral blood flow (CBF) in ischemic stroke patients (Table 8).

#### Poststroke Diseases

Electric acupuncture could alleviate shoulder pain in cerebrovascular attack patients (77). It was demonstrated that BVA at LI15 and SI10 decreased visual analog scale of pain severity and increased painless passive range of motion of shoulder external rotation in hemiplegic shoulder pain patients (78). Kang and Baik (79) compared the therapeutic value of transcutaneous electrical nerve stimulation with interventional current therapy, infrared or hot pack treatments for

shoulder pain in cerebrovascular attack patients. Lee and Lee (80) evaluated the effect of acupuncture and electric acupuncture on shoulder hand syndrome by using DITI. Kang *et al.* (81) examined the balanced bladder time and residual urine volume and demonstrated the clinical efficacy of moxibustion at CV3, CV4 and CV6 in patients with voiding dysfunction after a cerebrovascular accident (Table 9).

#### Acupuncture for Facial Palsy

Acupuncture treatment was beneficial in 72 cases of patients with facial paralysis (82). Moreover, electric acupuncture was better than needling in the treatment of patients with peripheral facial nerve paralysis (83). The effect of Hominis placenta acupuncture, a kind of HA, on Bell’s palsy was reported (84). It was demonstrated that Saam acupuncture at liver and stomach tonification points could treat peripheral facial palsy (85). Cho *et al.* observed the change of clinical symptoms and DITI, showing the benefits of acupuncture and herbal medicine in patients with Bell’s palsy (86,87).

**Table 5.** Acupuncture for low back pain

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Kim and Choi (20)	HNP of L-spine	20	CA	15 min 1/2 days various times	None	Classified into five groups (excellent, good, moderate, slight and not improved) by clinical evaluation	Excellent, 25%; good, 20%; moderate, 10%; slight, 20%; not improved, 25%	N/A
Kim and Chae (36)	LBP and sciatica	96	CA (0.25 × 40 mm)	15 min 1/2 days various times	Negative, carbon, infrared, ICT, hot pack, traction, etc. (some cases)	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 26%; good, 35.4%; fair, 28.1%; poor, 10.4%	N/A
Lee <i>et al.</i> (42)	Stable thoracolumbar vertebral fracture	20	Acute stage Depletion of blood (A-shi points, daily), afterward CA	Not stated	Herb-med, ICT, US, hot pack, Knight taylor kin support, Bohler exercise	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 30%; good, 60%; fair, 5%; poor, 5%	N/A
Lee (48)	HNP of L-spine	26	Chronic stage CA, afterward indirect moxibustion (same site, 3 piece)	15 min various times	Herb-med	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI	Excellent, 23%; good, 73%; fair, 4%; poor, 0%	N/A
Han (46)	Degenerative lumbar stenosis	37	EA (0.3 × 50 mm), HA (nutrient ducts 0.1–0.2 ml), indirect moxidustion (5 piece)	15–20 min 1/1–2 days various times	Herb-med, negative (daily)	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 13.5%; good, 56.8%; fair, 8.1%; poor, 21.6%	N/A
Hur <i>et al.</i> (51)	Spondylolisthesis	22	CA (0.25 × 30 mm), indirect moxibustion (pain site), fire needle	20–30 min daily various times	IFC, US, hot pack, etc.	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI	Excellent, 27.25%; good, 54.6%; fair, 13.65%; poor, 4.5%	N/A
Kim <i>et al.</i> (47)	Spondylolisthesis	28	CA (0.3 × 40 mm), EA (14 Hz constant), moxibustion	15–20 min various times	Herb-med, infrared, hot pack, ICT, US, cupping therapy, etc.	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 10.7%; good, 60.7%; fair, 25%; poor, 3.6%	N/A
Mun <i>et al.</i> (30)	HNP of L-spine	16	CA, indirect moxibustion (3 piece/1 day)	30 min daily various times	Herb-med, cupping therapy (5 min), Western medicine	Measure herniation rate through f/u computed tomography after 5–7 years	The largest herniations were those that had the greatest tendency to decrease in size	N/A
Lim <i>et al.</i> (40)	Acute back pain	34	CA	15–30 min 2/1 day various times	Whuallak-tang (over 7 days), cupping therapy, exercise	Classified into four groups (excellent, good, fair and poor) by clinical evaluation, measure AST, ALT, ALP	Excellent, 29.4%; good, 67.7%; fair, 2.9%; poor, 0%	N/A

**Table 5.** *Continued*

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Jin <i>et al.</i> (37)	Scoliosis	12	CA	Not stated	Chuna (daily), Herb-med, ICT, US, etc.	Measure correction rate through Cobb's angle (X-ray)	Symptoms↓, scoliosis angle↑, rotation degree↑,→	N/A
Jang <i>et al.</i> (21)	HNP of L-spine	30	CA (0.3 × 40 mm and 0.4 × 80 mm)	15–20 min daily various times	Herb-med, hot pack, ICT, EST, traction, cupping therapy, Chuna (cox), etc.	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI	Excellent, 20%; good, 43.3%; fair, 30%; poor, 6.66%	N/A
Park and Ahn (31)	HNP of L-spine	44	22 CA (0.3 × 40 mm), depletion of blood (A-shi points. 5–10 cc), EA (3.5–12 Hz, 9 V, 15 min)	15 min daily various times	TENS, infrared, traction, hot pack	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	EA group were more effective than CA group	N/A
Cho and Kim (50)	HNP of L-spine	40	22 CA (0.3 × 40 mm), EA (3.5–12 Hz at 9 V for 15 min)	25 min daily various times	Herb-med, IFC, US, cupping therapy, hot or ice pack	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI	EA group were more effective than CA group	N/A
Park and Lee (32)	LBP and sciatica	21	12 Dong-si acupuncture Tx (0.3 × 40 mm for 20–30 min), CA (0.3 × 40 mm for 40–80 min), EA (2.3–3.6 Hz at 2–6 V)	15–25 min daily various times	Herb-med, hot pack, cupping therapy, ICT, EST, traction, etc.	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination	Dong-si acupuncture (+CA+EA) group were more effective than CA (+EA) group	N/A
Lee and Hwang (33)	LBP and sciatica	28	9 CA (0.3 × 40 mm 40–80 mm), EA (2.3–3.6 Hz at 2–6V some cases)	Same			Saam acupuncture group (+CA+EA) were more effective than CA (+EA) group	N/A
Lee <i>et al.</i> (25)	HNP of L-spine	60	27 CA (0.3 × 40–80 mm), EA (2.3–3.6 Hz)	15–20 min daily various times	Hot pack, cupping therapy, ICT, EST, traction, Chuna, etc.	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination	Group with Oriental-Western medicine were more effective than group with Oriental medicine	N/A

Yoon <i>et al.</i> (34)	HNP of L-spine	30	15	CA (0.3 × 40–80 mm some points and A-shi point), EA (2.3–3.5 Hz)	15–25 min daily (each) various times	Hot pack, cupping therapy, ICT, EST, traction, chuna, etc.	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination	N/A
Chae <i>et al.</i> (35)	HNP of L-spine	29	17	CA (0.3 × 40–80 mm some points), EA (2.3–3.5 Hz)	15–25 min daily various times	None	Measure VAS	P < 0.05 Constitutional acupuncture group were more effective than CA group
Jeong <i>et al.</i> (52)	LBP	40	28	Smokers, CA (0.25 × 40 mm), EA Non-smokers: same	2/1 day (first 5 days) 1/1 day (after 5 days) for 10 days	Cupping therapy, Herb-med, hot pack, TENS, ICT, EST, FES	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination	Smoking ↑ → effectiveness ↓ N/S
Song <i>et al.</i> (45)	Thoracolumbar compression fracture	50	25	CA (0.3 × 30 mm Hua-Tuo-Jia-Ji-Xue acupuncture (45° oblique) and some points)	20–25 min daily various times	Cupping therapy, Herb-med, hot pack, ICT, TENS, lumbar belt	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination	Hua-Tuo-Jia-Ji-Xue acupuncture group were more effective than CA group N/A
Kim <i>et al.</i> (28)	LBP	33	17	CA (0.3 × 30 mm some points)	15–20 min daily various times	Same	Measure VAS, ROM, ODI	MENS had an effect on relieving LBP VAS (P < 0.05); ROM, N/S; ODI, N/S
Heo (38)	LBP	29	21	Discoogenic: CA (not stated) Simple back: CA (not stated)	15 min 1/3 days 6 times	Herb-med (4) Same	Measure improvement rate by VAS and LBP assessment questionnaire	Both discoogenic group and simple back pain group were improved by chuna Tx N/S; P < 0.05

MENS, microcurrent electrical neuromuscular stimulation; ODI, Oswestry disability index; HA, herbal acupuncture; LBP, Low back pain; IFC, interferential current; FES, functional electrical stimulation.

**Table 6.** Acupuncture for knee joint pain

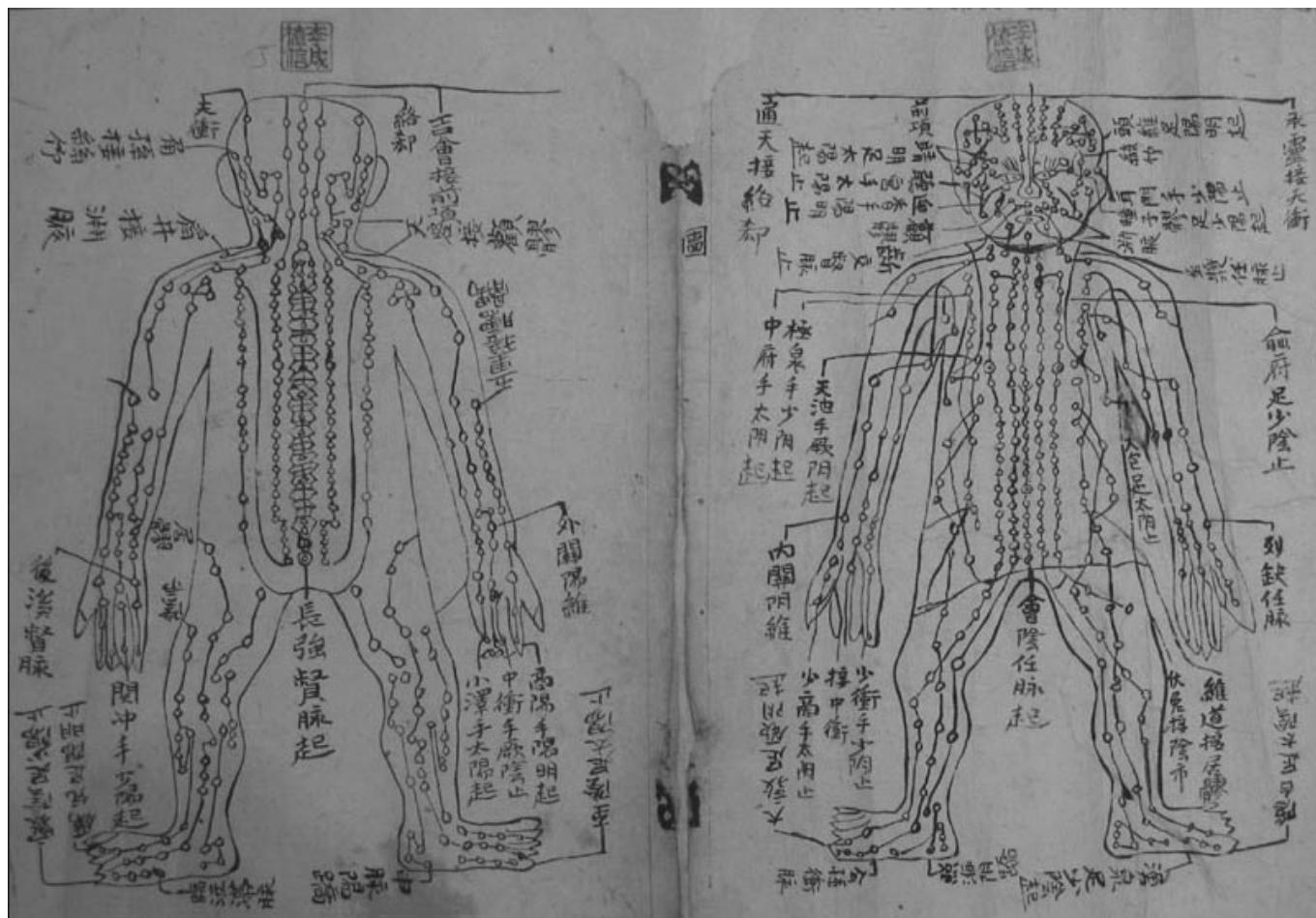
Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Koh and Kang (56)	OA of knee joint	50	CA (0.25 × 40 mm), moxibustion	15–20 min 1/1–2 days various times	Herb-med	Classified into three groups (excellent, good and no improvement) by clinical evaluation	Excellent, 28.2%; good, 46.2%; no improvement, 25.6%	N/A
Lee and Seong (55)	OA of knee joint	40	CA (10–30 mm) and fire needle, indirect moxibustion	15 min daily various times	Drugs for external application, Herb-med, exercise	Classified into four groups (excellent, good, fair and poor) by Martin A.N. method	Excellent, 70%; good, 15%; fair, 10%; poor, 5%	N/A
Na and Ahn (57)	OA of knee joint	47	CA (0.3 × 30 mm), moxibustion	Not stated	Cupping therapy (A-shi points), Herb-med and hot pack, IFC, US, TDP	Classified into four groups (excellent, good, slight good and poor) by assessment of Tx (American Rheumatism Association)	Excellent, 12.8%; good, 48.9%; slight good, 27.7%; poor, 10.6%	N/A
Woo <i>et al.</i> (58)	Microtraumatic injuries of the knee joint	15	Dong-si acupuncture (0.3 × 30 mm, 0.25 × 15 mm)	15–30 min 3/1 week for 3 weeks	Exercise (during acupuncture therapy)	Measure through scale of Cincinnati knee rating system	The mean number of before Tx was 60.6 and after was 66.5. A total of 66.6% of patients were improved	N/A
Wang <i>et al.</i> (59)	OA of knee joint	70	BV (4000:1, 0.1–0.2 ml/1 acupuncture point)	1–2/1 week various times	None	Classified into five groups (excellent, good, fair, poor and bad) by knee joint evaluation scale (Lysholm and Karlsson)	BVT may play a role in the significant usefulness against OA patients	P < 0.05
Kim and Lee (60)	OA of knee joint	60	BV (5000:1) CA (0.25 × 30 mm)	2/1 week 15 times 20 min daily various times	None	Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI	BVT group were more effective than CA group	P < 0.01
Hwang (62)	RA	18	HA (0.1 cc/1 acupuncture point), moxibustion	1/2–3 days various times	Cupping therapy (1/2–3 days)	Classified into four groups (excellent, good, moderate, poor) by criteria of American Rheumatism Association	Excellent, 6%; good, 6%; moderate, 3%; poor, 3	N/A
Hwang <i>et al.</i> (61)	RA	15	BV (0.1–0.2 cc/1 acupuncture point)	2/1 week various times	None	Measure CRP, ESR, RA factor, improvement index and classified into four groups (excellent, good, moderate and poor) by clinical evaluation	Excellent 40%; good, 46.7%; moderate, 13.30%; poor, 0%	N/A

BV, bee venom; BVT, bee venom therapy; RA, rheumatoid arthritis; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; OA, Osteoarthritis; TDP, Ten ding Diancibo Pt.

**Table 7.** Acupuncture for other painful diseases

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Choi and Lee (69)	Acute gout	21	CA (0.2 × 30 mm)	15 min daily various times	None	Classified into four groups (excellent, good, slight and unchanged) by clinical evaluation	Excellent, 75%; good, 25%; slight, 0%; unchanged, 0%	N/A
Bang <i>et al.</i> (67)	Tennis elbow	36	CA (0.3 × 50 mm), moxibustion (A-shi points, 3 pieces/1 week)	15 min 1/1–3 days various times	US, TENS, fixation (elastic band)	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 14.1%; good, 52.8%; fair, 21%; poor, 10.5%	N/A
Seung and Ahn (68)	Arthritis	65	Direct moxibustion	1/2 days 3 times	None	The immune activities of cell (LTT, E-RFC) and immune activity of ligand (IgG, IgA, IgM, C5) were observed.	The moxibustion showed good effect on the immune activity in the human body	Various P-values
Multineuritis		22	Indirect moxibustion (with cutting slice of fresh ginger or garlic bulb)	2/1 week		The immune activities of cell (3HTdR) were observed		
Choi and Moon (65)	Pain (various)	174	Depletion of blood (three-edged needle, vacuum extractor, A-shi points, totally 5–20 ml)	Not stated	Not stated	Classified into four groups (excellent, good, unchanged and bad) by clinical evaluation	Excellent, 20.12%; good, 61.49%; unchanged, 17.24%; bad, 1.15%	N/A
Shim <i>et al.</i> (63)	Pain	210	EA (0.2 × 50 mm, 0.3 × 65 mm, 12 REPP by using Neuro R-70, 3–10 Hz, 50–150 pp low frequency, etc.)	15–30 min 1–3/day 10 times	Not stated	Classified into four groups (marked improvement, improve, transient improvement, fail) by changes of investigation degree using Neuro R-70	Marked improvement, 43.3%; improve, 41.4%; transient improvement, 13.8%; fail, 1.5%	N/A
Kim <i>et al.</i> (66)	Ankle sprain	26	CA (0.3 × 40 mm)	20–30 min various times	Ice and hot pack, infrared	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Trigger point Tx group is more effective than CA group	N/A
Cho <i>et al.</i> (64)	Postthoracotomy pain	20	Trigger point Tx	Various times	Analgesic requirements	Measure scoring system for postoperative pain and the number of analgesic requirement	The number of analgesic requirement was reduced in the acupuncture group	P < 0.05
Ahn <i>et al.</i> (70)	Ankle sprain	21	CA (0.25 × 30 mm, intradermal needle (1/2 days))	20–30 min	None	Measure the amperage from 12 left and right Chong points	Between the control and the ankle sprain group, there were significant differences between the amperages. The acupuncture to acupuncture points in the painful side was not less effective than the acupuncture to acupuncture points	N/A
		10	CA (0.3 × 30 mm in the painful side)	5 min	5 min			
		10	CA (0.3 × 30 mm in the normal side)	5 min	None			
		10	None	None				

REPP, reactive electropenetrability point; EST, electrical stimulation therapy; HNP, herniated nucleus pulposus; SSP, silver spike point.



**Figure 2.** An excerpt from ‘The Simplified Diagram of Mingtang’ published in the Ming Dynasty. ‘Mingtang’ means mansion-house or hall and acupoints are called ‘the house of Qi’. This may be another correlating factor between ‘acupoint’ and ‘Mingtang’. Since ‘Mingtang’ gradually became a substitute for ‘acupoint’, the so-called ‘Mingtang diagram’ generally referred to ‘the diagram of acupoints’. (Courtesy of Dr Kim Nam-II, Department of Medical History, College of Oriental Medicine, Kyung Hee University, Seoul, South Korea.)

Kang *et al.* compared a group treated by Oriental-Western treatment with a group treated by Oriental medical therapy by evaluating House-Brackmann grading system and made a detailed evaluation of facial symmetry of Pillsbury and Fisch (88,89). Kim *et al.* (89) compared a group treated by both acupuncture and herbal medicine with a group treated by acupuncture in patients of facial nerve paralysis and demonstrated that the symptoms were improved in both groups. Kwon *et al.* (90) compared a group treated by conventional Oriental medicine therapy with a group treated by conventional Oriental medicine therapy and indirect moxibustion at ST4 and ST8 in peripheral facial paralysis patients (Table 10).

## **Acupuncture for Other Conditions**

### *Eye Disease (Ophthalmopathy)*

Acupuncture and venesection were useful in treating 22 patients who suffered from acute infectious conjunctivitis (91). Kim and Chae (92) reported 32 patients with cataract

or glaucoma who were treated by Oriental medicine and acupuncture. The therapeutic effect of acupuncture and moxibus-  
tion on the sight of near-sighted patients was also reported  
(93,94). Clinical studies were carried out to demonstrate the  
effect of Oriental medicine and acupuncture on amblyopia  
(95) (Table 11).

## *Nose Disease (Rhinopathy)*

Acupuncture was effective in the treatment of allergic rhinitis in 30 patients (96). Nasal acupuncture therapy was investigated to treat the chronic paranasal sinusitis and nasal obstruction (97,98) (Table 12).

### *Ear Disease (Otopathy)*

Clinical studies were carried out to investigate acupuncture, moxibustion and venesection for tinnitus (99,100). It was reported that acupuncture at TE5, GI41, TE6 SI5, GI38, KI2 and venesection improved symptoms of patients with otitis media with effusion (101) (Table 13).

**Table 8.** Acupuncture for stroke

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Park <i>et al.</i> (73)	Ischemic stroke	23	EA (intermittent)	15 min once	None	Measure BP, PR and CBF (by TCD) (before acupuncture, 5, 10 and 15 min after acupuncture)	EA at GV26-CV24 was effective on increasing BP, PR and CBF	<i>P</i> < 0.05
Ahn <i>et al.</i> (74)	Stroke (hypertension)	22	AA	For 24 h	None	Measure BP (every 1–2 h)	AA was effective on decreasing BP	<i>P</i> < 0.05
Moon <i>et al.</i> (76)	Ischemic stroke	28	13 EA (0.25 × 40 mm opposing needling 50 Hz intermittent) EA (0.25 × 40 mm ipsilateral-needling 50 Hz intermittent)	15 min once	None	Measure $V_m$ , $V_s$ , PI (3 times) by TCD	Opposing needling increased cerebral activity more than ipsilateral-needling ( $V_s$ )	<i>P</i> < 0.05
Kang <i>et al.</i> (75)	Stroke (hypertension)	30	15 CA (0.25 × 30 mm twirling 5–10 s) CA (0.25 × 30 mm sham acupuncture twirling 5–10 s)	Not stated once	None	Check BP 13 times (5 min for 15 min, 15 min for 45 min, 30 min for 2 h)	Acupuncture Tx at LI11, ST36 was useful to control temporary hypertension with acute stroke (especially systolic BP, from 5 to 150 min interval after acupuncture Tx)	<i>P</i> < 0.05
Lee <i>et al.</i> (72)	Stroke	79	62 HTN G: venesection (Sympun-points 1–2 cc) Normal G: same	Once		Check BP and BT twice before acupuncture Tx and 3 times after acupuncture Tx (every 30 min), undergo <i>post hoc</i> Scheffé index of GLM-repeated measured define factors	Venesection at Sympun-points decreased BP (case of severe degree)	<i>P</i> < 0.05
Ha <i>et al.</i> (71)	Stroke	29	14 CA (0.3 × 40 mm), scalp acupuncture (contralateral 10–15 min, twirling 1–3 min), moxibustion	15–20 min daily various times	Herb-med, cupping therapy, EST, etc. (some cases)	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	CA and scalp acupuncture group showed almost same effect compared with CA group	N/S
		15	CA (0.3 × 40 mm), moxibustion	Same				

CBF, cerebral blood flow; TCD, transcranial doppler sonography;  $V_m$ , mean blood flow velocity;  $V_s$ , systolic blood flow velocity; PI, pulsatility index.

**Table 9.** Acupuncture for poststroke diseases

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other Treatments	Assessment	Result of acupuncture therapy	Statistical analysis
Song <i>et al.</i> (77)	Poststroke hemiplegic shoulder joint, subluxation and pain	38	EA (0.25 × 40 mm, 8 points: origin and insertion site of supraspinatus, infraspinatus, deltoid m. 4 Hz intermittent), CA and moxibustion	15 min daily for 4 weeks	Shoulder exercise (15 min, 3/1 day), physical therapy	Measure ROM, VD and ID by X-ray, undergo muscle power evaluation (by AMA)	EA was effective on treating shoulder joint, subluxation and pain after stroke	ROM, $P < 0.001$ ; VD, $P < 0.05$ ; JD, $P < 0.01$
Lee and Lee (80)	Shoulder hand synd. after stroke	23	EA (0.25 × 40 mm at 5 Hz mixed) CA (0.25 × 40 mm)	20 min daily for 3 weeks 20 min	None	Measure DITI, ROM	EA group were more improved on the temperature difference of both dorsal hands than CA group	$P < 0.01$
Kang and Baik (79)	Poststroke shoulder pain	120	None	20 min daily for 3 weeks	None	Measure DITI and ROM	ICT and TENS group were effective on treatment of poststroke shoulder pain	$P < 0.05$
Yin <i>et al.</i> (78)	Poststroke hemiplegic shoulder pain	24	EA (0.25 × 40 mm, 8 points: origin and insertion site of supraspinatus, infraspinatus, deltoid m. 4 Hz intermittent), CA and moxibustion	20 min daily for 2 weeks	Not stated	Hot pack (20 min daily for 2 weeks), Herb-med	BVT group was effective than control group	$P < 0.05$
Kang <i>et al.</i> (81)	Poststroke voiding dysfunction	20	Indirect moxibustion (5 piece), CA	15 min daily for 2 weeks	Not stated	ICT (100 Hz constant, 15 min, daily for 2 weeks), Herb-med	On VAS, PROM	N/S
		10	CA	15 min daily for 2 weeks	Not stated	TENS (250 Hz, 15 min daily for 2 weeks)	Moxibustion was effective on poststroke, voiding dysfunction	

VD, vertical distance; JD, joint distance; AMA, American Medical Association; PROM, painless passive ROM of shoulder external rotation.

**Table 10.** Acupuncture for facial palsy

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Lee and Lee (82)	Peripheral Facial paralysis	72	CA (0.35 × 30 mm), Dong-shi acupuncture, EA, fire needle	20 min various times	Herb-med, SSP, carbon (20 min), EST (20 min at 3.5 Hz), infrared (20 min 3–4/l day)	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 55.56%; good, 19.44%; fair, 20.83%; poor, 4.16%	N/A
Lee (85)	Peripheral facial paralysis	85	CA (0.25 × 30 mm), EA (1–3 Hz for 1.5 min)	15–20 min 1/2–3 days various times	Infrared, Western medicine (steroid)	Classified into four groups (excellent, good, fair-poor and trace-zero) by clinical evaluation	Excellent, 31.76%; good, 32.94%; fair-poor, 23.53%; trace-zero, 11.77%	N/A
Song <i>et al.</i> (87)	Bell's palsy	11	CA (0.30 × 30 mm)	15–20 min various times	Infrared, TDP	Examine DTI (took picture ~7 days after the o/s), classified into six groups (normal, good, fair, poor, trace and zero) by the grading system of facial palsy	DTI is useful for prognostic diagnosis of Bell's palsy (temperature of abnormal site ↑ → prognosis is good)	N/S
Cho <i>et al.</i> (86)	Bell's palsy	16	CA (0.25 × 30 mm), fine needle	20–30 min various times	Herb-med, infrared, Carbon, TENS, hot pack, etc	Examine DTI (before and after Tx) and classified into four groups (excellent, good, fair and poor) by clinical evaluation	DTI shows therapeutic effect of acupuncture Tx	N/A
Lee and Han (83)	Peripheral facial paralysis	50	EA (0.25 × 40 mm, loose and dense wave (till first week)) CA (0.25 × 40 mm)	15–20 min 3 Hz various times	Infrared, carbon (20 min), facial massage and exercise	Classified into five groups (normal, excellent, good, fair and poor) by clinical evaluation	EA had a better effect than CA	N/A
Kang <i>et al.</i> (88)	Peripheral facial paralysis	72	CA (0.25 × 40 or 0.3 × 50 mm), EA (frequency 3 × 10 or 1 × 10 constant 15 min)	15 min various times 20–30 min various times	Infrared, hot pack, facial massage (some cases)	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 31.5%; good, 37%; fair, 13%; poor, 18.5%	N/A
Yun <i>et al.</i> (84)	Bell's palsy	16	HA (Hominis placenta 0.1–0.2 cc for 3 days), CA (0.25 × 30 mm)	Same	Same and prednisolone (for 10 days)	Excellent, 11.1%; good, 55.6%; fair, 33.3%; poor, 0%	Excellent, 7; good, 1 Excellent, 4; good, 2; fair, 0; poor, 2	N/A
		8	CA (0.25 × 30 mm)			Classified into four groups (excellent, good, fair and poor) by Muscle testing (Lucille Daniels)		

**Table 10.** Continued

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Kwon <i>et al.</i> (90)	Peripheral facial paralysis	30	14 CA (0.30 × 30–50 mm), joined puncture, EA (some cases, frequency 3 × 10 or 1 × 10, 15 min)	15–20 min 2–3/1 day various times	Indirect moxibustion (1–2/1 day), Herb-med, Western medicine infrared, hot pack, facial massage, etc	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 21.4%; good, 50%; fair, 21.4%; poor, 7.2%	N/A
		16	Same	Herb-med, Western medicine infrared, hot pack, facial massage, etc			Excellent, 12.5%; good, 31.3%; fair, 31.3%; poor, 25%	
Kim <i>et al.</i> (89)	Peripheral facial paralysis	46	31 CA (0.25 × 40 mm 0.3 × 40 mm), EA (frequency 3 × 10 or 1 × 10), depletion of blood (some cases)	15–20 min 1/1–3 days average 16.6 times	Herb-med, infrared, TDP, facial massage	Classified into four groups (excellent, good, fair and poor) by clinical evaluation	Excellent, 36%; good, 39%; fair, 19%; poor, 6%	N/A
		15	Same	Same average 16.4 times	Infrared, TDP, facial massage		Excellent, 33%; good, 47%; fair, 13%; poor, 7%	

### Skin Disease (Dermatology)

It was reported that acupuncture and herbal medicine were effective in the treatment of acne in 125 patients (102). It was also found that acupuncture and herbal medicine improved the symptoms of the acne patients (103) (Table 14).

### Hypertension

Clinical studies with auricular acupuncture were performed on 23 patients with hypertension (104). Lee *et al.* (105) examined moxibustion at LI11 and CV4 for blood pressure of hypertension patients (Table 15).

### Smoking and Drinking Cessation

Auricular acupuncture to stop smoking (106–110). Kim *et al.* investigated the effect of auricular acupuncture on cessation of drinking in alcoholic patients (111,112). It was reported that auricular acupuncture and herbal medicine were effective for quitting drinking (113) (Table 16).

### Obesity

Electric acupuncture decreased body weight, abdominal length, size of waist and body mass index (114,115). Lee and Kim (116) compared auricular acupuncture combined with acupuncture with auricular acupuncture combined with herbal medicine for the treating obesity by measuring body weight and percentage of body fat (Table 17).

### Nausea and Vomiting

Auricular acupuncture on sympathetic, stomach, shenmen and occiput points for postoperative nausea and vomiting in 100 female patients undergoing transabdominal hysterectomy. It was demonstrated that electric acupuncture at PC6 and PC7 was very effective in preventing nausea, retching and vomiting (118) (Table 18).

### Obstetrics and Gynecology

Electric stimulation at acupuncture points significantly shortened the delivery time and attenuated the pain during delivery (119). Moreover, endometrial curettage was successfully performed on 31 female patients under acupuncture anesthesia (120) (Table 19).

### Others

Moxibustion could have an effect on peripheral circulation (121). Ahn *et al.* (122) examined the temperature change of external genitalia in patients with impotence after herbal medicine and acupuncture treatment. Auricular acupuncture altered hormone and energy metabolism during weight control of athletes (123) (Table 20).

**Table 11.** Acupuncture for eye disease (ophthalmopathy)

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Sim <i>et al.</i> (91)	Acute infectious conjunctivitis	22	Depletion of blood, afterward CA	15 min various times	None	Classified into four groups (recovered, good, unchanged and aggravated) by clinical evaluation	Recovered, 20; good, 2	N/A
Chae (94)	Visual acuity	74	CA	Not stated average 2.25 times/week	Herb-med	Not stated	Not stated	N/A
Kim and Chae (92)	Glaucoma	4(3)+	CA	Not stated	Herb-med	Intraocular pressure, clinical evaluation	Intraocular pressure, 75%; improved, 75%	P < 0.05
Cataract		5(0)+					Improved, 40%; acuity↓, 20%	N/S
Causing-blindness-disease		23(16) =32					Improved, 57%; not changed, 30%	P < 0.05
Choi <i>et al.</i> (93)	Near sightedness	25	The stamp acupuncture, CA (0.25 × 30 mm), AA, moxibustion (2/month)	20 min 3/week	None	Measure the improvement rate of eye sight in each cases of wearing glasses or not. Classified into four groups (good, fair, poor and fail) by the improvement degree of both eyes	Points not wearing glasses were more improved than points wearing glasses Good, 44%; fair, 40%; poor, 12%; fail, 4%	P < 0.05
Kim <i>et al.</i> (95)	Amblyopia	18	The stamp acupuncture, CA (0.25 × 30 mm), AA	20 min 3/week for 3 months	Herb-med	Measure the improvement rate of eye sight in each cases of wearing glasses or not and undergo an eye sight test (2/month 3 times)	Acupuncture was effective in improvement of eye sight. Improvement degree 0.2↑, 33%; 0.1–0.2, 50%; 0.1↓, 17%	P < 0.05

**Table 12.** Acupuncture for nose disease (rhinopathy)

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Kim and Park (96)	Allergic rhinitis	30	CA, EA (2 Hz, intensity 2–3)	20 min 2–3/week average 22.8 times	Herb-med	Clinical evaluation	Frequency of treatment $\downarrow$ → improvement $\uparrow$	N/A
Kim and Yoon (98)	Nasal obstruction	32	Nasal acupuncture (10 × 140 mm)	15 min 2–3/week	Infrared	Classified into three grades by ant. rhinoscopy, afterward classified into four groups (excellent, good, unchange and worse) by evaluated grades	Excellent, 31.3%; good, 53.1%; unchanged, 9.4%; worse, 6.2%	N/A
Seo and Lee (97)	Empyema	19	Nasal acupuncture (0.375 × 160 mm and oblique acupuncture into orifice of Sinus maxillaris)	15 min daily average 11 times	Infrared	Classified into three groups (excellent, good and unchanged) by clinical evaluation, rhinoscopy and X-ray	Excellent, 4; good, 13; unchanged, 2	N/A

**Table 13.** Acupuncture for ear disease (otopathy)

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Park <i>et al.</i> (99)	Tinnitus	30	CA	1/2–3 days	Infra, cupping therapy, laser therapy, moxibustion, Herb-med	Score (0–7) by questionnaire, measure success rate and recovery rate	Success rate, 76.6%; recovery rate, 42.2%	N/A
Kim (100)	Tinnitus	47	CA	Not stated	Cupping therapy, moxibustion, Herb-med	Classified into four groups (complete recovered, significant, good and unchanged) by changes of symptom	Tinnitus included in other symptoms and accompanied by vertigo vertigo $\rightarrow$ treatment efficiency $\downarrow$	N/A
Lee <i>et al.</i> (101)	Otitis media with effusion	18	Depletion of blood, CA (0.20 × 30 mm)	15 min (stimulation 2 times) average 14.5 times	None	Classified into three groups (excellent, good and unchanged) by clinical evaluation and otoscopy	Excellence, 22.2%; good, 66.7%; unchanged, 11.1%	N/A

**Table 14.** Acupuncture for skin disease (dermatopathy)

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Chae (102)	Acne (Comedo)	125 (117)	CA	20 min 2–3/1 week average 5–44 times	Herb-med, drugs for external application	Score (1–20) by Consensus conference on acne classification	Not stated	N/A
Kim and Kim (103)	Acne (Comedo)	8 (4)	Methods of reinforcement and reduction, AA	Not stated 2/week (AA)	Drugs for external application (medicinal powder for Comedo), Herb-med	Clinical evaluation	None	N/A

### Acupuncture for Human Study

Acupuncture stimulation significantly decreased electrical resistance under the adiaphoresis, suggesting that the decrease of electrical resistance is caused not only by sweat secretion but also by other internal resistance (124). Youn *et al.* (125) reported a strong correlation between acupuncture at KI6 and cortical activation in the motor-related region of the human brain by using fMRI. Acupuncture at LI4 in the left hand increased regional CBF (rCBF) in the right parietal lobe, middle temporal gyrus and inferior occipital lobe, and electric acupuncture at ST36 on the right side increased rCBF in the left temporal lobe, the inferior frontal lobe and cerebellar hemisphere using single photon emission computed tomography (126,127). It was shown that acupuncture at LI4 and LV3 could ipsilaterally enlarge a blind spot map (128).

Several studies were performed to examine if acupuncture at LI4 changed skin temperature in the LI4 area of the hand, LI11 area of the arm, LI20 area of the face and ST25 area of the abdomen by using DITI (129–135). It was also examined to see whether the alteration of acupuncture manipulation method could change the temperature in these regions of the body (136,137). Other studies were performed to investigate the effects of acupuncture at LU9 by thermal change in the five shu points or LU9 and LU1 areas of lung meridian (138,139). Yook *et al.* (140) examined whether HA at BL12, BL13, BL41 and BL42 could affect local thermal change by using DITI. Kim *et al.* (141) examined whether acupuncture at the WuHu acupoint could affect thermal change in the ankle region (Table 21).

### Discussion

A large number of clinical studies have used acupuncture; electric acupuncture, moxibustion and other traditional therapies to target a relatively broad range of medical problems, primarily pain and stroke. Moreover, acupuncture has been widely used for treatment of facial palsy, obesity, hypertension, nausea and vomiting, and many other diseases. However, as mentioned in the beginning of this report, the studies had various weaknesses such as inadequate sample size, inappropriate control treatment, inadequate follow-up, inadequate control of non-specific effects, inadequate reporting of side effects and a few studies' failure to replicate results. These concerns make it difficult to draw clear conclusions about efficacy in most areas where acupuncture has been tested.

A number of systematic reviews on acupuncture for specific conditions have recently been published, including an extensive systematic review on chronic pain, with a far reaching search strategy and a way of scoring trial methodology (142). Recently, the best evidence synthesis review showed that there was only limited evidence that acupuncture is more effective than no treatment (waiting list) and inconclusive evidence that acupuncture is more effective than inert placebo, sham acupuncture or standard medical care (143). In addition, the

**Table 15.** Acupuncture for hypertension

Author name(s)	Condition treated	Number of points	Type of acupuncture	Length and number of Tx	Other treatments	Assessment	Result of acupuncture therapy	Statistical analysis
Byun and Ahn (104)	Hypertension	23	AA	2/1 week	None	Classified into five groups by average BP (Tokyo University)	AA was effective on treating hypertension	N/A
Lee <i>et al.</i> (105)	Hypertension	25	Indirect moxibustion (3 piece)	2/1 week 10 times	None	Measure BP 6 times (1/1 week)	Constant moxibustion at L111, CV4 showed decrease of BP	<i>P</i> < 0.05

**Table 16.** Acupuncture for smoking and drinking cessation

Author name(s)	Number of points	Type of acupuncture and acupuncture points	Length and number of Tx	Other treatments	Assessment	Result of acupuncture therapy	Statistical analysis	
Lee <i>et al.</i> (110)	606	CA (0.25 × 40 mm) afterward, AA (same points)	15–20 min 2/week various times	None	Classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation	Recovered, 40.5%; good, 26.7%; moderate, 19.5%; slight, 5.3%; unchanged, 8.1%	N/A	
Ahn <i>et al.</i> (107)	107	AA	2/week average 4.07 times	None	flu 1 year after Tx, classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation	Recovered, 22.4%; good, 5.6%; moderate, 19.6%; slight, 16.8%; unchanged, 35.5%	N/A	
Hwang <i>et al.</i> (106)	203	CA (0.3 × 30 mm) afterward, AA (same points)	20 min 2/week various times	None	Classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation	Recovered, 24%; good, 32%; moderate, 27%; slight, 5%; unchanged, 12%	N/A	
Choi (109)	37	AA, CA (contralateral side)	1.5 min 2/week average 2.95 times	None	Classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation	Recovered, 43.2%; good, 24.3%; moderate, 16.2%; slight, 13.5%; unchanged, 2.7%	N/A	
Choi and Hwang (108)	439	249	AA	2/week for 3 weeks	None	Classified into five groups by clinical evaluation and compare	Between exercise/control no significant difference, but AA: effective	N/A
Kim <i>et al.</i> (111)	233	CA (0.25 × 40 mm), AA (same points, contralateral side)	15–20 min 1/3–4 days various times	None	Classified into five groups (recovered, good, moderate, slight and unchanged) by quit-drinking duration	The success rate, 74.7%; the recovered rate, 43.8%	N/A	
Park and Peun (113)	50	CA, afterward AA (both sides, same points)	20 min 2/week average 7.36 times	Herb-med	None	None	N/A	
Lee <i>et al.</i> (112)	133	CA, AA (same points, contralateral side)	15–20 min 2/week for 5 days	Herb-med	Classified into three groups (good, fair and no response) by clinical evaluation	Good, 52.7%; fair, 14.5%; no response, 32.8%	N/A	

**Table 17.** Acupuncture for obesity

Author name(s)	Number of points	Type of acupuncture and acupuncture points	Length and number of Tx	Other treatments	Assessment	Result of acupuncture therapy	Statistical analysis
Lee and Lee (114)	72	EA (left and right eight acupuncture points located on the abdomen, horizontal method, 200–250 Hz)	40 min average 8.60 times	None	Classified into four groups (good, moderate, slight and unchanged) by changes of weight and circumference of abdomen	Good, 25%; moderate, 31.9%; slight, 31.9%; unchanged, 11.2%	N/A
Jeong <i>et al.</i> (115)	9	CA (various), EA (not stated), AA (various)	Not stated average (EA) 12.9 times	Various (diet, exercise, etc.)	Measure weight, fat mass, percent body fat, fat distribution, relative body weight, BMI	Weight (kg), 5.66↓; fat mass (kg), 3.28↓; percent body fat (%), 2.83↓; fat distribution, 0.05↓; relative body weight (%), 10.4↓; BMI, 2.2↓; circumference of abdomen, 2.25↓	N/A
Lee and Kim (116)	16	8 CA, AA	15 min daily	For 7 weeks (3 weeks, first period; 1 week, rest; 3 weeks, second period)	Measure weight, percent body fat, compare exercise group, with control group and first period with second period	AA–CA group was more effective than AA–Herb-med group	N/A
	8	AA, afterward stick Sinapis semen	15 min 1/3 days				

BMI, body mass index.

**Table 18.** Acupuncture for nausea and vomiting

Author name(s)	Condition treated	Number of points	Type of acupuncture (exercise group) Type of acupuncture (control group)	Length and number of Tx (exercise group) Length and number of Tx (control group)	Other treatments	Assessment	Results of acupuncture therapy	Statistical analysis
Kim <i>et al.</i> (118)	Postoperative nausea and vomiting	100	50 EA (0.25 × 40 mm PC6 PC7 twirling 3 Hz intensity till not feeling pain) 50 None	15 min None	Various Tx for op. Not stated None	Check incidence of nausea, retching and vomiting blindly every 3 h after op. for 12 h	EA group showed better results for 12 h after op. (every 3 h)	P < 0.001
Kim <i>et al.</i> (117)	Postoperative nausea and vomiting	100	50 AA 50 None	Various Tx for op. Not stated None	Check incidence of nausea, retching and vomiting blindly every 3 h after op. for 12 h	AA group showed better results for 12 h after op. (every 3 h)	P < 0.01	

Op., operation.

**Table 19.** Acupuncture for obstetrics and gynecology

Author name(s)	Condition treated	Number of points	Type of acupuncture number and acupuncture points	Length and number of Tx	Other treatments	Assessment	Result of acupuncture therapy	Statistical analysis
Kim and Kim (120)	Acupuncture anesthesia (curettage)	31	EA (0.25 × 40 mm 1–3.5 Hz adjust intensity)	During curettage	None	Classified into three groups (excellent, good and poor) by injection amount of penothal sodium	Excellent, 22; good, 5; poor, 4	N/A
Kim <i>et al.</i> (119)	Labor in primipara	39	12 EA (1–3 Hz constant, adjust intensity)	From active phase (first stage of labor) to phase of placental separation (third stage of labor) once	None	The duration of labor of exercise group was shorter than that of control group	The duration of labor of exercise group was shorter than that of control group	$P < 0.05$
		27	None	None				

**Table 20.** Acupuncture for other conditions

Author name(s)	Condition treated	Number of points	Type of acupuncture and acupuncture points	Length and number of Tx	Other treatments	Assessment	Result of acupuncture therapy	Statistical analysis
Hwang and Yang (121)	Peripheral blood circulation disturbance	20	Indirect moxibustion (three piece)	Once	None	Measure peripheral blood circulation using assessing 22 grades	The indirect moxibustion (10-jong points) were useful for peripheral blood circulation	N/A
Ahn <i>et al.</i> (122)	Impotence	12	Saam acupuncture	Not stated 1/week for 2 months	Herb-med	Measure the temperature using DITI	The thermo-difference of left thigh and glans penis, both scrota increased significantly	$P < 0.05$
You <i>et al.</i> (123)	The change of hormone and energy metabolism during weight control of Taekwondo players	20	10 AA	1/3 days for 2 weeks	Low calorie diet, sauna and regular exercise, etc.	Analysis the level of Na+, K+, Cl-, Ca++, creatinine, cortisol, epinephrine, and norepinephrine	AA was shown increase levels of Na+, cortisol, epinephrine, decrease levels of leptin that products of ob-gene	$P < 0.05$ (Na+, cortisol, epinephrine) $P < 0.01$ (leptin)

**Table 21.** Acupuncture for human study

Author name(s)	Number of points	Type of acupuncture and acupuncture points	Length and number of Tx	Assessment points	Measure moments	Result of acupuncture therapy	Statistical analysis
Lee <i>et al.</i> (129)	15	CA (0.25 × 40 mm right LI4 twirling 7–8 times)	30 min	LI4 LI11	Before acupuncture stimulation, 30 s, 1 min, 10 min, 30 min after acupuncture stimulation and 10 min after needle-removal	DI TI is a useful method to observe and /or the effects and the changes by acupuncture stimulation for objective evaluation	N/A
Han <i>et al.</i> (131)	54	CA (0.3 × 30 mm left LI4)	15 min	LI20	Before acupuncture stimulation, 5, 10 and 15 min after acupuncture stimulation	Acupuncture can modulate the equilibrium of Um-Yang and Keo-ja theory	Various P-values
Sohn <i>et al.</i> (130)	95	73 CA (0.25 × 30 mm both or right LI4)	10 min	LI4 ST25	Before acupuncture stimulation, and 1, 10 min after acupuncture stimulation	Acupuncture on LI4 affects to thermal changes of LI4 and ST25	Various P-values
Song <i>et al.</i> (132)	42	22 None 27 CA (0.25 × 30 mm right LI4)	10 min	LI11 LI20	Before acupuncture stimulation, and 1, 10 min after acupuncture stimulation	Acupuncture on LI4 affects to thermal changes of LI11 and LI20	Various P-value
Song <i>et al.</i> (137)	60	15 None 20 CA (0.3 × 30 mm left LI4 left)	10 min	LI1-5	Before acupuncture stimulation, and 10 min after acupuncture stimulation	One point with the left or right rotary acupuncture stress effects the other points which have relation with it	Various P-values
Hwang <i>et al.</i> (134)	100	20 CA (0.3 × 30 mm left LI4 right) 35 CA (0.3 × 30 mm left LI4)	10 min 10 min	None LI4 ST25 CV12	Before acupuncture stimulation, and 5, 10 min after acupuncture stimulation	Acupuncture on LI4 affects to thermal changes of ST25 and CV12 (abdominal surface)	Various P-values
Yun <i>et al.</i> (135)	30	35 CA (0.3 × 30 mm both LI4) 30 None 10 None	10 min None None	GV25 and left LI20 right S4 and right LI20 left S4	Before acupuncture stimulation, and 3, 10, 15, 25 and 45 min after acupuncture stimulation	The skin temperature of EA group were more increase than the control group. The temperature of H5, 7 group were more increase than the LI3, 4 group	Various P-values
Kim <i>et al.</i> (139)	60	10 EA (0.3 × 30 mm right LI4 LI3 2 Hz Hi-CONT.) 10 EA (0.3 × 30 mm right H7 H5 2 Hz Hi-CONT.) 30 CA (0.3 × 30 mm L9)	10 min 15 min 15 min	LU9 PT7 LU1 CV22	Before acupuncture stimulation, and 10 min after acupuncture stimulation	The acupuncture stimulation on L9 affected the thermal change of the area that is a meridian point, in lung meridian	Various P-values

Table 21. Continued

Author name(s)	Number of points	Type of acupuncture and acupuncture points	Length and number of Tx	Assessment points	Measure moments	Result of acupuncture therapy	Statistical analysis
Yook <i>et al.</i> (140)	23	30 N/S (0.05 cc/l acupuncture point)	None None	BL12 BL13 BL41 BL42	Before HA, and 1, 24, 48 h, 7 days after HA	HA fluid has different effects on the dermatothermal change following times. BU group is latest in duration of physical reaction	Various P-values
	22	HA (Carthami semen 0.05 cc/l acupuncture point)	None				
	23	HA (Fei Ursi + Bezoar Bovis, 0.05 cc/l acupuncture point)	None				
Song and Yook (138)	60	30 CA (0.3 × 30 mm left L9)	10 min	LU8-LU11, LU5 (five shu points)	Before acupuncture stimulation, and 10 min after acupuncture stimulation	The acupuncture on L9 affected the thermal change of the area that was the five shu points in the lung meridian	Various P-values
	30	None	None				
Kim <i>et al.</i> (141)	45	25 Dong-shi acupuncture (0.3 × 40 mm Wu-Hu) 20 None	10 min None	BL60 BL62 GB40 ST41	Before acupuncture stimulation, and 10 min after	The acupuncture on the Wu-Hu was effective at the ankle region	Various P-values
Park (124)	15	CA (0.25 × 40 mm Lt. P8)	12 min		Measure the electrical resistance of anesthetized left P6, anesthetized non-acupuncture point, normal left P4 and normal right P6	When the acupuncture stimulation is applied to human body, the decrease of electrical resistance is not only to sweat secretion but also to other internal resistance	$P < 0.01$ (dry electrode) $P < 0.05$ (wet electrode)
Youn <i>et al.</i> (125)	5	CA (K16)	(Twist for 70 s and rest for 70 s) × 3		Examine BOLD response by fMRI	Acupuncture at K16 resulted in negative BOLD response to stimulation	Not stated
Kim <i>et al.</i> (126)	11	5 EA (0.3 × 40 mm ST36 2 Hz constant)	20 min		Measure rCBF by rest/EA TC-99m ECD brain SPECT using a same-dose subtraction method	EA at ST36 increased rCBF in the contralateral cerebral hemisphere	$P < 0.9$
Oh <i>et al.</i> (127)	11	6 Sham acupuncture 5 CA (0.3 × 40 mm left LI4) 6 Sham acupuncture	20 min 15 min 15 min		Measure rCBF by rest/EA TC-99m ECD brain SPECT using a same-dose subtraction method	Acupuncture at left LI4 increased rCBF in the right hemisphere (the right parietal lobe, a part of the right middle posttemporal gyrus and the right inferior occipital lobe)	$P < 0.9$
Woo and Nam (128)	20	10 CA (right LI4 LR3) 10 CA (left LI4 LR3)	20 min 20 min		Measure changes in blind spot mapping (manual perimetry)	Acupuncture ipsilateral side → blind spot map↓, contralateral cortical activity↑. Acupuncture contralateral side → blind spot map↓, contralateral cortical activity↓	N/A

BOLD, blood oxygen level dependent; rCBF, regional cerebral blood flow; SPECT, single photon emission computed tomography; BU, Calculus Bovis; Fei Ursi; ECD, ethyl cysteinate dimer.

evidence of rigorous randomized controlled trials showed that there was no compelling evidence to show that acupuncture is effective in stroke rehabilitation (144). Yet, as clinicians who treat patients with acupuncture, we have success in these treatments where no efficacy is found. This is due to a complex set of problems at the heart of which is the establishment of a standard for the treatment of the control group. This article is not a systematic review; rather it is an overview of the clinical trials, presented in the hopes of introducing overall information about clinical studies in Korea to the English-speaking world.

This review describes a number of clinical studies that were performed to compare the therapeutic effects of different kinds of acupuncture under certain conditions. Conventional acupuncture was compared with electric acupuncture, auricular acupuncture, BVA and manipulation. These comparative studies of different kinds of acupuncture are required in order to proceed with the most adequate method in the future. Since more than two therapies were simultaneously performed to treat the disorders in some studies, it is not likely to demonstrate the efficacy of pure acupuncture apart from other treatments. For instance, given that both acupuncture and auricular acupuncture were effective to treat tension-type headache patients, it is impossible to clarify the extent of the therapeutic benefit of acupuncture. Therefore, in order to investigate the therapeutic benefits of acupuncture, it is necessary to establish a group treated by acupuncture alone.

From the above clinical studies, it is possible to summarize the originality of Korean acupuncture by describing both of its characteristic approaches—individualized and practical. Firstly, a number of clinical studies in Korea have shown the benefits of individualized acupuncture treatment, such as Saam, Taegeuk or Eight constitutions acupuncture (35). Patel *et al.* (145) noted that individualized treatments significantly favored acupuncture, whereas formulaic approaches, in which all the patients received the same treatment, showed no significant difference. However, in order to demonstrate its superiority, more rigorous and well-designed randomized controlled clinical trials are urgently needed. Secondly, HA-like BVA have been used to treat a variety of painful conditions. HA is a new method of acupuncture where distilled herbal decoction is extracted and purified to be administered to an acupuncture point for stimulation. HA simultaneously exerts pharmacological actions from a bioactive compound isolated from herbal medicine and mechanical actions from acupuncture stimulation. The Korean medical world considers HA as a promising therapeutic method for various diseases (84,140).

An individualized approach based on constitutional energy traits have been widely applied to a number of clinical trials in Korean medicine. HA have also been developed as a new therapeutic modality using integrated and practical approaches. Korean acupuncture in its own way is making a contribution to the emerging need for individualized and integrated approaches to acupuncture. In closing, we stress the need for randomized controlled studies and express our hope that this view into Korean traditional medical practice will lead to

evidence-based studies that could form the basis for a meta-analysis in the near future.

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